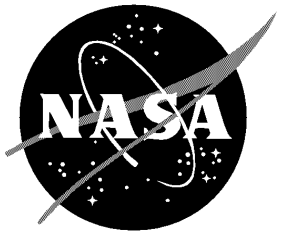

National Aeronautics and Space Administration

June 6, 1997
NRA 97-OSS-10

Research Announcement

Planetary Instrument Definition and Development Program

Proposals Due: **September 5, 1997**

OMB Approval No. 2700-0087

Planetary Instrument Definition and Development Program

NASA Research Announcement (NRA)
Soliciting
Proposals for Basic Research
Proposals Due September 5, 1997

NRA 97-OSS-10
Issued: June 6, 1997

Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

Planetary Instrument Definition and Development Program

This NASA Research Announcement (NRA) solicits basic research proposals for the Planetary Instrument Definition and Development Program. The purpose of this program is to support scientific research efforts which define and develop, to the breadboard stage, instruments for future NASA planetary missions.

Participation in this program is open to all categories of domestic and non-U.S. organizations, industry, educational institutions, other nonprofit organizations, NASA centers, and other Government agencies. The proposals that are received by the deadline, noted below, will be evaluated by scientific peer reviews, and selections are anticipated in November 1997. Further details relevant to this program are included in the appendices to this Announcement. The complete text of the NRA and appendices are available through the World Wide Web at the URL address:

<http://www.hq.nasa.gov/office/oss/>, open "Research Opportunities" from the menu.

Appendix A provides technical and program information in the general area in which proposals are sought, plus amendatory guidance to Appendix B, applicable only to this NRA. Appendix B contains the basic guidance needed for preparation of solicited proposals in response to an NRA. Appendix C provides the forms required for proposal submission. The following items, likewise, apply only to this Announcement:

Identifier:	NRA 97-OSS-10
Obtain additional information and hard copies of NRA from:	Dr. Bruce A. Campbell Planetary Instrument Definition and Development Program NRA 97-OSS-10 Code SR NASA Headquarters Washington, DC 20546-0001 Phone (202) 358-0297 Fax (202) 358-3097 bruce.campbell@hq.nasa.gov
Proposal Deadline:	September 5, 1997
Proposal Copies Required:	Mail 17 copies (one with original signature) to: Planetary Instrument Definition and Development Program Jorge Scientific/SAIC 400 Virginia Avenue SW, Suite 700 Washington, DC 20024 Phone (202) 554-2775
Selecting Official:	Director Research Program Management Division Office of Space Science

This NRA replaces other Planetary Instrument Definition and Development Program announcements of previous years. Since it is significantly different in both content and emphasis from these earlier announcements, potential proposers should read this NRA carefully.

Your interest and cooperation in participating in this effort are appreciated.

Dr. Jurgen H. Rahe
Science Program Director
Solar System Exploration
Office of Space Science

Dr. Edward J. Weiler
Science Program Director
Astronomical Search for
Origins and Planetary Systems
Office of Space Science

Appendix A: **Description of Program**

Appendix B: **Instructions for Responding to NASA Research Announcements**

Appendix C: **Cover Page Form and Certification Forms: Debarment and Suspension, Drug-Free Workplace, Lobbying**

PLANETARY INSTRUMENT DEFINITION AND DEVELOPMENT PROGRAM

I. PROGRAM SCOPE

The Planetary Instrument Definition and Development Program (PIDDP) supports the advancement of spacecraft-based instrument technology that shows promise for use in scientific investigations on future planetary missions. The goal of the program is not to develop flight-qualified hardware, but rather to define and develop scientific instruments or components of such instruments to the point where the instruments may be proposed in response to future announcements of flight opportunity without additional extensive technology development. Therefore, the proposed instrument technology must address specific scientific objectives of candidate future missions. New measurement concepts can be proposed, as well as methods to significantly improve the performance of existing instruments and/or the development of technologies to enable integrated instrument packaging (architectures). The emphasis in this NRA is also on the development of miniaturized, low power, and low cost instruments for Discovery-class and other similar missions. Instrument definition and development studies can take place at several stages, from feasibility studies, to conceptual design, to laboratory breadboarding (but not brassboarding) of critical components and complete instruments.

Results of PIDDP work have contributed to the eventual development of flight hardware flown on or selected for many NASA missions. This is the goal of the PIDDP program and proposals should consider the potential of the proposed effort for enhancing future technology validation and science missions. This NRA also solicits proposals for instrument concepts addressing goals of NASA's Exobiology Program. Instrument development activities that were previously funded under the Exobiology Research and Analysis Program are now included exclusively in the PIDDP.

Proposals not appropriate for this NRA are those that would seek to develop laboratory instruments, ground-based or airborne telescopes, auxiliary instrumentation for telescopes such as spectrometers, or onboard data processing or data compression studies.

This research announcement is issued annually. The nature of specific efforts selected for funding will vary, with emphasis in any given year placed on preparation for the nearest term missions for which instruments have not yet been selected. However, there can also be support provided for long lead-time definition studies, for innovative approaches that may provide entirely new classes of instruments, for the development of new enabling technology for missions further in the future, and/or for detector development studies that may advance the technology for a wide range of planetary instrumentation applications. Proposers are encouraged, however, to relate their development efforts as closely as possible to specific future planetary missions and must demonstrate how their technology will address scientific questions and goals of these missions.

II. FUTURE MISSION PLANS

The **Solar System Exploration Program** supports research in cosmochemistry, planetary geology and geophysics, planetary atmospheres and astronomy, origins of solar systems, and exobiology, and anticipates the following principal flight opportunities during the next decade:

- The Discovery Program of small planetary missions. The first two Discovery missions, the Near Earth Asteroid Rendezvous (NEAR) and the Mars Pathfinder, have been launched. A mission to the Moon, Lunar Prospector, and a comet sample return mission, Stardust, were the next two missions selected. Announcement of Opportunity AO 96-OSS-02 for the Discovery 5 mission was issued in September 1996, and currently five mission proposals are undergoing definition studies leading to a down-selection in the fall of 1997. Future AO's are anticipated on a 12-18 month basis.

- Mars Surveyor missions, including orbiters and landers utilizing small to medium spacecraft. The first of these is the Mars Global Surveyor, launched in November 1996. Instruments for two follow-on missions, an orbiter and lander, have been selected for launch in 1998. The AO for a Mars 2001 orbiter and lander mission will be issued in June 1997. Future launches to Mars will occur approximately every 26 months.

- Cassini, a NASA/ESA mission to Saturn and Titan, for which instruments have already been selected.

- Participation in the European Space Agency (ESA) ROSETTA mission to a comet expected to be launched January 2003, for which instruments have been selected.

- Outer planets missions to Europa, Pluto, and perhaps Titan. The AO for the first of these missions will be issued in 1998.

III. PIDDP-FOCUSED FUTURE MISSIONS

Proposals for instrument definition and development for certain of the following future missions will be considered for funding under this NRA.

1. Discovery Program

The Discovery Program is envisaged as a series of small, focused, quick-turnaround missions. Development time will be approximately 36 months, and launch vehicles will not be larger than a Delta-II. The Discovery missions may include flyby, orbiter, lander, Earth orbiting, and sample return missions to a variety of solar system objects to study surface and atmospheric composition, thermal structure, meteorology, geoscience, topography, dynamics, and field and particle environments. Instrumentation and techniques addressing seminal scientific questions in this broad range are appropriate development efforts under this PIDDP NRA; technology applicable to multiple missions and investigations will have higher priority for funding.

Under this NRA, instrument definition and development will be considered only for missions that follow NEAR, Mars Pathfinder, Lunar Prospector, and Stardust missions. New instrument development proposals for missions already selected for development or Phase A study will not be accepted under this NRA.

2. Mars Surveyor Missions

Although the scientific objectives of each of these missions vary greatly, their scientific payloads will consist of small, lightweight, and low power consumption instruments.

NASA Office of Space Science (OSS) plans include a Mars orbiter in 2001 to complete the recovery of the Mars Observer science, along with a lander/rover package. Since the AO for these payloads will be issued in June 1997, this NRA will not support the development of instrumentation for this mission. However, instrument development proposals for both

U. S. and international follow-on missions to Mars are appropriate under this NRA. It is expected that these missions will include additional Mars orbiters and landers that will be launched after 2001. Consideration will also be given to proposals addressing the development of instrumentation for Mars sample return missions, a major focus of Mars exploration in 2003 and beyond. Instrument technologies for the *in-situ* exploration of Mars are of particular interest for future missions. This NRA seeks new concepts for Mars surface science, including but not limited to potential instruments for radiometric age-dating, soil/rock mineralogy and chemistry, water/ice detection and characterization, exobiology assessment, drilling/coring, and atmospheric analyses.

3. Outer Solar System Missions

Missions to the outer planets and satellites are a specific NASA objective. An AO is expected to be released in 1998 for a mission to Europa or Pluto. Additional future opportunities might also include focused science missions under the Discovery Program, or entry probes for outer planet atmospheric studies.

This NRA solicits instrument concepts for future outer planet missions, including but not limited to Europa, Pluto, Jupiter, or Titan probes, and comet nucleus sample returns. Particular emphasis will be placed on Europa for this NRA. These missions may include flybys, orbiters, landers (Titan, Europa, or comets), or aerobots (Titan), so science instruments relevant to remote and in-situ studies of these bodies are solicited. Instrument concepts include but are not limited to ice-penetrating radar sounding systems, laser altimeters, and lightweight imaging systems with broad spectral range. Atmospheric entry probe concepts, including mass spectrometer miniaturization, will also receive consideration.

4. Origins of Solar Systems

NASA's long-range strategy includes flight missions that will follow on and extend the ground based phase of the search for planets about other stars, and several approaches for space based platforms addressing the search for extrasolar planetary systems have been identified. Breadboard studies of technologies and instruments (consistent with the limited scope of the PIDDP) that could contribute to the space-based search for extrasolar planets are appropriate for this NRA.

IV. PROPOSAL GUIDELINES AND EVALUATION CRITERIA

Proposals are solicited under this NRA for instrument definition and development for only the missions or classes of missions described in Section III.

It is anticipated that the scientific payloads on all future solar system exploration missions will be limited to small, low mass, low power consumption, and low cost instruments. For this reason, only proposals for instrument definition and development satisfying these general specifications will be considered for support.

Therefore, all proposals submitted must specify:

- The mission or class of missions for which the proposed instrument is applicable. Instruments that might fly on a number of missions will be given priority over those applicable to only a single mission.

- The science objectives of the proposed instrument. The relationship between the science objectives and the instrumental capabilities must be clearly demonstrated. For those instruments applicable to many missions or capable of meeting multiple science objectives, examples of science objectives for the proposed mission or missions should be given.

- Technological advances to be pursued as an inherent element of achieving the science objectives. Proposers are also asked to identify potential mechanisms that could facilitate transfer of these technologies to other users, including the private sector, for possible application beyond the immediate one of meeting mission science objectives.

"EVALUATION FACTORS" described in Appendix B, Section 13, are superseded as follows:

The principal elements in evaluating a proposal are relevance to the Solar System Exploration and/or Origins programs, intrinsic merit, and cost, with the first two being of approximately equal weight and each carrying greater weight than the third.

The determination of a proposal's relevance is based on a combination of factors:

- The extent to which the proposed instrument is applicable to multiple missions in the Solar System Exploration and/or Origins programs.

- The extent to which the instrument addresses a priority science goal of the mission or missions for which it would be a candidate for flight.

- Either the near-term nature of the mission or missions in question, or the necessity of embarking on a long lead-time development of a very important instrument contemplated for flight on a mission that is of high priority, even though it is not in the near-term queue.

It should be noted that the contemplated sequence of missions described in this Announcement is a best current estimate and is subject to change. NASA reserves the right to make a determination of relevance based on the contemplated sequence of missions as it is understood at the time of proposal evaluation and selection.

Evaluation of a proposal's intrinsic merit includes consideration of the following factors, where factors 1, 2, and 3 carry somewhat more weight than factors 4, 5, and 6.

1. Overall scientific and technical merit.

2. Uniqueness of the proposed instrument development in the sense that it:

    - Leads to significant reductions in instrument size, mass, power, and cost.
    - Provides an entirely new approach that significantly enhances the state of the art, thereby enabling critical enhancements to scientific investigations.

3. Overall standing among similar proposals available for evaluation and/or evaluation against the known state of the art.

4. Potential for successful technology transfer to secondary applications, including commercial applications, in other areas.

5. Qualifications, capabilities, and experience of the proposal’s principal investigator and team.

6. Offeror's capabilities, related experience, facilities, techniques, or unique combinations of those which are integral factors for achieving the proposed objectives.

Evaluation of the cost of a proposed effort includes the relationship of the proposed cost to available funds, as well as the realism and reasonableness of the proposal cost.

V. EDUCATION AND PUBLIC OUTREACH

Education and public outreach are expected to be part of each NASA flight program and research discipline. NASA strongly encourages researchers not only to engage actively in education and public outreach, but also to include such activities in their proposals. The proposal section for Education Outreach follows the main proposal's Project Description. The funding dedicated to education and public outreach may be up to 10% of the project's budget, or $6k, whichever is less. Further details on the NASA OSS Education Policy may be found in *Partners in Education: A Strategy for Integrating Education and Public Outreach Into NASA's Space Science Programs* that describes the Office of Space Science's approach for making education at all levels and the enhancement of the public understanding of science integral parts of space science research activities. The document *Implementing the Office of Space Science (OSS) Education/Public Outreach Strategy* describes the NASA OSS policy for implementation. Both documents may be obtained by opening "Publications" from the menu of the URL address: <http://www.hq.nasa.gov/office/oss/>. Proposals will not be selected solely or primarily on the strength of their education/outreach components, although the quality of a proposed education/outreach effort could be used as an additional factor in selecting among otherwise equal proposals. Evaluation criteria for education components will include:

- The educational effectiveness and realism of program concept,
- existence of effective partnerships with educational institutions and/or effective leveraging of existing resources and the prospects for the program to have a multiplier effect,
- capability of proposers to carry out the proposed program,
- consistency with national educational reform efforts, and
- consistency of the budget with the guidelines given in the document *Implementing the OSS Education/Public Outreach Strategy.*

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VI. PROGRAM MANAGEMENT INFORMATION

Full, new proposals are sought for either entirely new studies or for the extension of PIDDP studies terminating in FY 1997. Proposals may specify periods of performance of one, two, or three years. A final report is required at the termination of the period of performance. Studies selected previously for multiple year periods of performance and that are continuing beyond FY 1997 require submission of brief renewal proposals at least 90 days prior to the anniversary date consisting of a progress report, certifications, and updated budget (excluding contracts), but do not require submission of a full proposal.

It is expected that there will be approximately $3.3 million dollars available for new (and extension) proposals, and that 15-20 studies will be supported with these funds. Funding for the investigations selected will begin in FY 1998.

VII. SUPPLEMENTARY PROPOSAL PREPARATION GUIDANCE

1. Cover, Abstract, and Summary Pages:

The "Transmittal Letter or Prefatory Material" section of Appendix B is modified as follows:

The first four pages of the proposal after the transmittal letter should be the following prefatory material (see Appendix C): a Cover Page that must be signed by an official of the

principal proposing institution empowered to commit the institution to carry out the proposed work if the proposal is selected; an abstract page that summarizes the proposed activity; a summary of current and pending research support; and a budget summary for the proposed period of performance. Note that the funding information on the fourth page is intended as a convenient summary and not a replacement for the detailed budget.

2. Certification Forms:

The following completed and signed certification forms, provided in Appendix C, must be attached to the proposal:

1. Certification Regarding Debarment, Suspension, and Other Responsibility Matters.

2. Certification Regarding Drug-Free Workplace Requirements.

3. Certification Regarding Lobbying (required for proposals requesting a cumulative amount of funding of $100,000 or more).

3. Proposal Length:

The "Length" section of Appendix B is revised as follows:

The maximum length of each proposal is limited to 15 non reduced, single spaced typewritten pages for the research objectives, detailed work plan, expected results, relevance of proposed work, and the roles of personnel. Each side of a sheet of paper containing text or figures is considered a page. Use type font 10 point or larger, minimum 1-inch margins, and standard 8.5x11 inch paper.

4. Proposal Costing Detail:

With regard to the cost detail desired, the guidelines outlined below should be followed. Sufficient proposal cost detail and supporting information will facilitate a speedy evaluation and award. In particular, dollar amounts proposed with no explanation (e.g., Equipment: $58,000, or Labor: $110,000) will cause delays in evaluation and grant award. Therefore, the proposal costing information should be sufficiently detailed to allow the Government to identify costed elements for evaluation purposes. Generally, the Government will evaluate costs as to reasonableness, allowability, and allocability. An example of a Proposal Cost Summary is shown below. The summary is only an example and does display the desired detail. Each category should be explained. Offerors should exercise prudent judgment as the amount of detail necessary varies with the complexity of the proposal.

Direct Labor

Labor costs should be segregated by titles or disciplines with estimated hours and rates for each. Estimates should include a basis of estimate such as currently paid rates or outstanding offers to prospective employees. This format allows the Government to assess cost reasonableness by various means including comparison to similar skills at other organizations.

Indirect Costs

Indirect costs should be explained to an extent that will allow the Government to understand the basis for the estimate. Examples of prior year historical rates, current variances from those rates, or an explanation of other basis of estimates should be included.

Where costs are based on allocation percentages or dollar rates, an explanation of rate and application base r

Other Costs

Each significant cost category, such as travel and equipment purchases, must be detailed, explained, and substantiated.

Proposal Cost Summary

The format for a cost summary is given in Appendix C, and must be submitted with the proposal. The proposing institution may also submit the budget in the format of its own choosing for additional information.

VIII. GUIDELINES FOR FOREIGN PARTICIPATION

NASA welcomes proposals from outside the U.S. However, investigators working outside the U.S. are not eligible for funding from NASA. Proposals from non-U.S. entities should not include a cost plan. Proposals from outside the U.S. and U.S. proposals that include non-U.S. participation, must be endorsed by the respective government agency or funding/sponsoring institution in that country from which the non-U. S. participant is proposing. Such endorsement should indicate that the proposal merits careful consideration by NASA, and if the proposal is selected, sufficient funds will be made available to undertake the activity as proposed.

In addition to sending the required number of copies of the proposals to the designated address, one copy of the proposal, along with a Letter of Endorsement from the sponsoring non-U.S. agency, must be forwarded to:

Ms. Bettye Jones
(NRA 97-OSS-10)
International Science and Aeronautics Division
Code IS
NASA Headquarters
Washington, DC 20546-0001
USA

All proposals must be typewritten in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. All proposals must be received before the established closing date; those received after the closing date will be held for the next proposal cycle. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address if endorsement is not possible before the announced closing date. In such cases, however, NASA's International Science and Aeronautics Division should be advised when a decision on endorsement can be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Research Program Management Division. Copies of these letters will be sent to the sponsoring government agency. Should a non-U.S. proposal or a U.S. proposal with non-U.S. participation be selected, NASA's International Science and Aeronautics Division will arrange with the non-U.S. sponsoring agency for the proposed participation on a no-exchange-of-funds basis, in which NASA and the non-U.S. sponsoring agency will each bear the cost of discharging their respective responsibilities. Depending on the nature and extent of the proposed cooperation, these arrangements may entail:

1. a letter of notification by NASA; and
2. an exchange of letters between NASA and the sponsoring governmental agency, or
3. a formal Agency-to-Agency Memorandum of Understanding (MOU)

APPENDIX B

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS

Part 1852.235-72
NASA Federal Acquisition Regulations (FAR) Supplement (NFS)
Version 89.90, Effective March 11, 1997.

Accessible at URL
<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>,
open Part 1852.228 to 1852.241 from menu.

(JANUARY 1997)

A. General.

(1) Proposals received in response to a NASA Research Announcement (NRA) will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a preaward synopsis published for individual proposals.

(2) A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

(3) NRA's contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRA's.

(4) A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument. Contracts resulting from NRA's are subject to the Federal Acquisition Regulation (FAR) and the NASA FAR Supplement (NFS). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NPG 5800.1).

(5) NASA does not have mandatory forms or formats for responses to NRA's; however, it is requested that proposals conform to the guidelines in these instructions. NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

(6) To be considered for award, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

B. NRA-Specific Items. Several proposal submission items appear in the NRA itself: the unique NRA identifier, when to submit proposals, where to send proposals, number of

copies required, and sources for more information. Items included in these instructions may be supplemented by the NRA.

C. Proposal Content. The following information is needed to permit consideration in an objective manner. NRA's will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

(1) *Transmittal Letter or Prefatory Material*.

(i) The legal name and address of the organization and specific division or campus identification, if part of a larger organization;

(ii) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;

(iii) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;

(iv) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;

(v) Identification of other organizations that are currently evaluating a proposal for the same efforts;

(vi) Identification of the NRA, by number and title, to which the proposal is responding;

(vii) Dollar amount requested, desired starting date, and duration of project;

(viii) Date of submission; and

(ix) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization(unless the signature appears on the proposal itself).

(2) *Restriction on Use and Disclosure of Proposal Information*. Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following Notice on the title page of the proposal and specify the information subject to the notice by inserting an appropriate identification in the Notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the Notice.

Notice

Restriction on Use and Disclosure of Proposal Information

The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract(or other agreement) is awarded on the basis of this proposal, the Government shall have the right to use and disclose this information (data) to the extent provided in the contract(or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

(3) *Abstract*. Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

(4) *Project Description.*

(i) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance, relation to the present state of knowledge, and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(ii) When it is expected that the effort will require more than one year, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

(5) *Management Approach*. For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described.

(6) *Personnel*. The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications, and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in

evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry-university cooperative arrangements should be described.

(7) *Facilities and Equipment.*

(i) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use. Include evidence of its availability and the cognizant Government points of contact.

(ii) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non research purposes should be explained.

(8) *Proposed Costs.*

(i) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages, fringe benefits, equipment, expendable materials and supplies, services, domestic and foreign travel, ADP expenses, publication or page charges, consultants, subcontracts, other miscellaneous identifiable direct costs, and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel). Estimate all staffing data in terms of staff-months or fractions of full-time.

(ii) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired, purpose and estimated number and lengths of trips planned, basis for indirect cost computation(including date of most recent negotiation and cognizant agency), and clarification of other items in the cost proposal that are not self-evident. List estimated expenses as yearly requirements by major work phases.

(iii) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 1831(and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

(9) *Security*. Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

(10) *Current Support*. For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

(11) *Special Matters*.

(i) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as

may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(ii) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

D. Renewal Proposals

(1) Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.
(2) NASA may renew an effort either through amendment of an existing contract or by a new award.

E. Length. Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments.

F. Joint Proposals.

(1) Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

(2) Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

G. Late Proposals. A proposal or modification received after the date or dates specified in an NRA may be considered if doing so is in the best interests of the Government.

H. Withdrawal. Proposals may be withdrawn by the proposer at any time before award. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

I. Evaluation Factors

(1) Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

(2) Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

(3) Evaluation of its intrinsic merit includes the consideration of the following factors of equal importance:

(i) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.
(ii) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(iii) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(iv) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

(4) Evaluation of the cost of a proposed effort may include the realism and reasonableness of the proposed cost and available funds.

J. Evaluation Techniques. Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases, proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of-interest and protection of proposal information), such as by mail or through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

K. Selection for Award.

(1) When a proposal is not selected for award, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

(2) When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model award instrument and other information pertinent to negotiation.

L. Cancellation of NRA. NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for anyone's failure to receive actual notice of cancellation.

(End of provision)

Standard Forms

- Proposal Cover Page
- Proposal Abstract
- Total Budget Summary
- Yearly Budget Summary
- Current and Pending Support
- Certification Regarding Debarment, Suspension, and Other Responsibility Matters (signature is required for all proposals)
- Certification Regarding Drug-Free Workplace Requirements (signature is required for all proposals)
- Certification Regarding Lobbying, if total multi-year funding >$100,000 (signature is required for all proposals)

REQUIRED CONTENTS OF STANDARD PROPOSAL

COVER SHEETS

- COVER PAGE
- PROPOSAL ABSTRACT
- BUDGET SUMMARY FOR TOTAL
- BUDGET SUMMARY FOR EACH YEAR
- CURRENT AND PENDING SUPPORT
- TABLE OF CONTENTS (Optional)

MAIN BODY OF PROPOSAL (Limited to 15 pages)

- RESEARCH OBJECTIVES
- DETAILED WORK PLAN
- EXPECTED RESULTS
- RELEVANCE OF PROPOSED WORK
- ROLE OF PI, CO-I, AND OTHER PERSONNEL
- SUPPORTING FACILITIES
- REFERENCES

RESUMES OF PRINCIPAL INVESTIGATOR AND CO-INVESTIGATORS

DETAILED BUDGETARY AND ADMINISTRATIVE INFORMATION

CERTIFICATIONS

- CERTIFICATION REGARDING DRUG FREE WORKPLACE
- CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS
- CERTIFICATION REGARDING LOBBYING (IF REQUIRED)

PLANETARY INSTRUMENT DEFINITION AND DEVELOPMENT PROGRAM

Log No. _____

Date Received: _____

Do not write in the shaded area.

NRA #: _____

Date Submitted: _____

INSTRUMENT DISCIPLINE (Please check all boxes appropriate to this proposal):

o SURFACE/IN SITU	o OPTICAL SYSTEMS	o PARTICLES AND FIELDS
o RADIO MILLIMETER SUBMILLIMETER	o BASIC COMPONENTS (e.g. detectors, refrigerators etc.)	o OTHER

TARGET MISSION (Please check all boxes appropriate to this proposal)

o DISCOVERY o MARS O OUTER SOLAR SYSTEM o ORIGINS

Proposal Title: _____

Principal Investigator (Name): _____

Institution: _____

Address: _____

City/State/Zip Code: _____

Telephone: (_____)_____ **Fax**: (_____)_____

E-Mail Address: _____

Institution Contact or Business Representative:

Telephone: (_____)_____ **Fax**: (_____)_____

Signature: _____

Please list all names and institutions below (use separate sheet if necessary)

Co-Investigators: **Institutions**:

Proposed Duration of Project: _____ months

Desired Start Date: _____ **End Date**: _____

Budget Request:

Year 1	Year 2	Year 3
$_____	$_____	$_____

Total Funding Requested: $_____

PROPOSAL ABSTRACT

PROPOSAL TITLE: _____

PRINCIPAL INVESTIGATOR/INSTITUTION: _____

Type single-spaced within the space provided below. List:

1) Goals, overall objectives, and justification of the work;
2) Progress and accomplishments, if supported in previous years
3) PI/Co-I's relevant publications on separate page (list in this way: Smith, A. B.: Spectroscopy of Comet Halley. AP. J. 123, 25-37, 1987).

DO NOT USE ADDITIONAL SHEETS.

BUDGET SUMMARY

FROM: _____ TO _____

TITLE OF INVESTIGATION:

PRINCIPAL INVESTIGATOR / INSTITUTION:

		NASA USE ONLY	
	A	**B**	**C**
1. Direct Labor (salaries, wages, and fringe benefits)	_____	_____	_____
2. Other Direct Costs: a. Subcontracts	_____	_____	_____
b. Consultants	_____	_____	_____
c. Equipment	_____	_____	_____
d. Supplies	_____	_____	_____
e. Travel	_____	_____	_____
f. Other	_____	_____	_____
3. Indirect Costs	_____	_____	_____
4. Other Applicable Costs	_____	_____	_____
5. Subtotal--Estimated Costs	_____	_____	_____
6. Less Proposed Cost Sharing	_____	_____	_____
7. Carryover Funds (if any) a. Anticipated amount	_____	_____	_____
b. Amount used to reduce budget	_____	_____	_____
8. Total Estimated Costs	_____	_____	XXXXXXXX
APPROVED BUDGET	XXXXXXX	XXXXXXX	_____

Instructions

1. Provide a separate Budget Summary sheet for **each year** of the proposal research.
2. Grantee estimated costs should be entered in Column A. Columns B and C are for NASA use only. Column C represents the approved grant budget.
3. Provide in attachments to the budget summary the detailed computations of estimates in each category, along with any narrative explanation required to fully explain proposed costs.

---------- ADDITIONAL INSTRUCTIONS ON FOLLOWING PAGE ----------

INSTRUCTIONS FOR BUDGET SUMMARY

1. Direct Labor (salaries, wages and fringe benefits). Enclosures should list number and titles of personnel, amount of time devoted to the grant, and rates of pay.

2. Other Direct Costs.

   a. Subcontracts - Enclosures should describe the work to be subcontracted, estimated amount, recipient (if known), and the reason for subcontracting this effort.
   b. Consultants - Identify consultants to be used, why they are necessary, time to be spent on the project, and rates of pay.
   c. Equipment - List separately and explain the need for items of equipment exceeding $1,000. Describe the basis for the estimated cost.
   d. Supplies - Provide general categories of needed supplies, the method of acquisition, estimated cost, and the basis for the estimate.
   e. Travel - List the proposed trips individually, describe their purpose in relation to the grant, provide dates and destinations where known, and explain how the cost for each was derived.
   f. Other - Enter the total of any other direct costs not covered by 2.a through 2.e. Enclose an itemized list explaining the need for each item and the basis for the estimate.

3. Indirect Costs. Identify indirect cost rate(s) and base(s) as approved by the cognizant Federal agency, including the effective period of the rate. If unapproved rates are used, explain why and include a computational basis for the indirect expense pool and corresponding allocation base for each rate.

4. Other Applicable Costs. Enter the total of any other applicable costs not covered by instructions 1 through 3. Enclose an itemized list explaining the need for each item and the basis for the estimate.

5. Subtotal -- Estimated Costs. Enter the sum of items 1, 2.a through 2.f, 3, and 4.

6. Less Proposed Cost Sharing (if any). Enter the amount proposed, if any. If cost sharing is based on specific cost items, identify each item and amount in enclosures.

7. Carryover Funds (if any). Enter the dollar amount of any funds that are expected to be available for carryover from the prior budget period.

8. Total Estimated Costs. Enter the total after subtracting items 6 and 7 from item 5.

CURRENT AND PENDING RESEARCH SUPPORT

Provide the following information for all current research support from all other sources. Also include the proposed project and all other research requiring a part of the PI's time. State the number of person months regardless of the source of the support.

Name of Principal Investigator _____

A. Current Support

1. Source of Support _____
2. Project Title _____
3. Award Amount _____
4. Period of Award _____
5. Person-Months _____

B. Pending Proposals (including supplement applications)

1. Source of Support _____
2. Project Title _____
3. Award Amount _____
4. Period of Award _____
5. Person-Months _____

Other Agencies to which this proposal, or parts thereof, has been submitted:

_____

_____

Duplicate this page as many times as needed to provide a complete list.

Certification Regarding Drug-Free Workplace Requirements
Grantees Other Than Individuals

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or government wide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

This grantee certifies that it will provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing a drug-free awareness program to inform employees about -
- The dangers of drug abuse in the workplace;
- The grantee's policy of maintaining a drug-free workplace;
- Any available drug counseling, rehabilitation, and employee assistance programs, and
- The penalties that may be imposed upon employees for drug abuse violations in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will -
- Abide by the terms of the statement; and
- Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;

(e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;

(f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2) , with respect to any employee who is so convicted -
- Taking appropriate personnel action against such an employee, up to and including termination; or
- Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph (a), (b), (c), (e), and (f).

Organization Name	PR/Award Number or Proposal Name
Name and Title of Authorized Representative	
Signature	Date

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211).

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
   (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
   (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
   (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
   (d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature | Date

Certification Regarding Lobbying

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

Organization Name PR/Award Number or Proposal Name

Name and Title of Authorized Representative

Signature Date